CONTROL TECHNIQUES™

INTELLIGENT PUMP CONTROL PROVIDES SIGNIFICANT MAINTENANCE & ENERGY SAVINGS

CUSTOMER PROFILE

Scottish Water's Levenhall Sewage Pumping Station, near Edinburgh, had significant issues with pump blockages making it an ideal site to trial the low cost innovative Intelligent Pump Control (IPC) software pre-installed into a Nidec Control Techniques Unidrive SP AC drive.

THE CHALLENGE

Ragging causes a decrease in pumps' hydraulic efficiency, increasing power consumption and causing pump blockages – and this is often addressed by over -izing pumps by more than 20%.

Several new approaches to the problem of pump blockage detection and control had been tested and evaluated at Scottish Water. The Nidec IPC system is unique as it monitors active current to determine variations in torque, which then triggers a reversing cycle to break up rags as they begin to form on the impeller.

Levenhall SPS has a consented pump forward flow of 675l/s and an average static head of about 7.2m.

The pumping station has four foul pumps rated at 43kW with currents of 35amps/ phase at the theoretical pump duty point. The pumping station had an annual power bill of around £28,000 and required about £15,000 per annum of operational interventions to deal with ragging, blockages and pump trips. There were also additional hidden costs, such as the knock-on effects of resources being diverted to deal with problems.

THE SOLUTION

Pump No. 1 was tested and from the outset blockages were eliminated and the average running current and peak operating currents for Pump No. 1 were seen to be significantly reduced by around 15%, this was then repeated on a second pump. However, ragging on the two other pumps continued to be a problem, with rag balls as big as 600-mm diameter being seen. Unidrive SP AC drives with IPC were installed on the remaining two pumps to alleviate the problem.

THE BENEFITS

Blockages and partial blockages were happening two or three times each week. With the new IPC system, all pump blockages stopped immediately, the rag balling issues in the wet well declining over the first week with running currents on all drives reducing. The Levenhall trial proved that Nidec's IPC system can more than adequately address pump blockage detection and control, increasing pumping efficiency significantly, and providing huge reductions in energy and opex costs.

KEY BENEFITS

- **PUMPING EFFICIENCY IMPROVED UP TO 15%**
- **ENERGY SAVIGNS OF £4,200 P.A.**
- **ADDITIONAL OPEX SAVINGS >£15,000 P.A.**

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